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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

AGRICULTURE IN PARAGUAY

BY

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October 25, 1951
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Foreword

A staff member of the Economic Department of I.B.R.D., who visited Paraguay in August 1951, prepared this report for the management of the Bank. For this reason it does not reflect the views or policies of the Directors or management of the Bank.

The writer had an opportunity to visit most of the agriculturally important areas and institutions of the country, thanks to the courtesy of the Central Bank of Paraguay and the Servicio Tecnico Interamericano de Cooperacion Agricola.

Washington, D.C.
October, 1951.
AGRICULTURE IN PARAGUAY

SUMMARY

Practically all of Paraguay's 100,000 odd farmers live in the eastern part of the country where they cultivate an area of 360,000 ha. Four-fifths of them are concentrated around Asuncion and the central railroad where they try to farm on worn-out, but basically good, soil. Two-thirds of these farmers have less than 7.5 ha. each, and most of them have no legal title to the land they occupy. Corn, manioc, cotton and sugar are their main crops. Their equipment is scanty and obsolete and their technical training is very poor.

Outside this Central Zone live the cattle ranchers, who own most of the stock of 3.4 million head of cattle which graze on extensive natural pastures. In these outer provinces one also finds a number of colonies populated either by farmers who moved out of the Central Zone, or by immigrants.

The three main agricultural problems in Paraguay are:

(1) The development of the Central Zone; this is mainly a question of providing vocational training and advice, combined with a suitable credit system, adequate distribution of tools, fertilizers and good seeds, the legalization of land titles, and improvement of transport conditions.

(2) The rehabilitation of the cattle industry which is in a serious decline: a better price system and the provision of medicines, veterinary services, and barbed wire for fencing purposes, will improve the situation.

(3) The development of colonies in sparsely populated departments: this requires the adoption of an appropriate immigration policy and the provision of machinery for land clearing and cultivation, together with suitable loans. Funds must also be made available to build roads which would connect the colonies with their markets.

More detailed recommendations are given on Page 11.
I. BASIC CONDITIONS

(a) Geography and Population

A clear distinction should be made between the part of Paraguay east of the River Paraguay and the western part, the Chaco. This western part is very sparsely populated; cattle ranching and the collecting of quebracho are the main occupations. Since present loan negotiations are not concerned with the Chaco, this report will be limited to East Paraguay.

In this area most of the people (60% of the total population) are concentrated in a half circle having a radius of 100 km. Its center is in Asuncion. Of secondary importance is an area of 25 km. extending on both sides of the 110 year old railroad from Asuncion to Encarnacion. Four-fifths of the rural population lives in these two areas. The rest of East Paraguay is sparsely populated but is important as an area of prospective colonization (there are opportunities for large numbers of emigrants from Europe) and of forestry.

Paraguay has a total area of 40 million ha., of which 16 million ha. are located east of the Paraguay River. One-tenth of this eastern area is cultivated by about 100,000 farmers; in 1950/51 the distribution of the agricultural land was believed to be as follows:

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>cultivated land (fruit included)</td>
<td>360,000 ha.</td>
</tr>
<tr>
<td>idle land</td>
<td>150,000 ha.</td>
</tr>
<tr>
<td>pastures</td>
<td>700,000 ha.</td>
</tr>
<tr>
<td>woodlands</td>
<td>400,000 ha.</td>
</tr>
<tr>
<td>farmyards</td>
<td>18,000 ha.</td>
</tr>
<tr>
<td>other farmlands</td>
<td>30,000 ha.</td>
</tr>
<tr>
<td><strong>Total Land Use in Farms</strong></td>
<td><strong>1,658,000 ha.</strong></td>
</tr>
</tbody>
</table>

Two-thirds of the farms average less than 7.5 ha., of which only a few hectares are cultivated at a time. A rather wide variety of crops is grown. In the regions now being colonized farms are larger, ranging from 20 ha. to 70 ha. Of the remaining area, nearly 22 million ha. are forest (mainly in the eastern half of East Paraguay) and 16 million ha. are grass pampas (mainly in the Chaco and in the northern part of East Paraguay).

(b) Land Tenure

The land tenure situation is very confused as a result of the disastrous war of 1865-70 against Argentina, Brazil and Bolivia. Two-thirds of the farmers have no land titles at all and are classified as squatters, 12% rent their land and 22% own it by legal title. The Institute for Agrarian Reform is attempting to clarify this situation.
(c) **The Soil**

The soils of Paraguay are now being surveyed by experts of the Servicio Tecnico Interamericano de Cooperacion Agricola (STICA). A survey discloses that most of the soils under cultivation are red sandy or clay loams. Along the Parana river there are deep red soils derived from basalt and volcanic ash. These are the best soils in the country. In the Central Zone the land is, broadly speaking, of fair to poor physical quality and has been worn out by century long primitive treatment. But if this land were well cultivated and fertilized, satisfactory crops could be grown.

(d) **Climate**

The climate in East Paraguay is of the sub-tropical continental type. The average maximum temperature in summer is 35°C; the average minimum temperature in winter is 10°C. December, January and February are very warm. Sudden changes in temperature are typical for the country.

Precipitation is in general satisfactory; it ranges from 1800 mm. in the east to 1200 mm. near the Paraguay river and 600 mm. in the West Chaco. Most of the rain falls in heavy showers of 25 mm. and more, suggesting the advisability of constructing water storage facilities in some regions.

(e) **The People**

Recent data about the number of persons active in agriculture are not available. The only agricultural census ever taken in Paraguay was that of 1942/43 which shows that at that time there were 95,000 farm families totaling 540,000 people, or 5.7 per farm. The number of people actually working on the farms was computed at 157,000 (including 9000 peons) which is 23% of the total population between 15 and 50 years old.

The farmers of Paraguay, broadly speaking, can be divided into three groups:

1. The ordinary farmer, whose family has lived for generations in Paraguay and who usually operates a mixed farm consisting of some hectares of arable land (manioc, corn, cotton and sugar cane being the most common crops), a smaller or larger acreage of grazing land and some waste land. These farmers have practically no knowledge of modern methods and are hardly ever in contact with educational and advisory services. To bring them on a higher technical and social level is the most difficult problem in the field of agricultural development in Paraguay.

2. The cattle ranchers, of whom 2.5% own more than 2/3's of the cattle in the country. This small group owns over 500 head of cattle each. A number of them are willing to learn modern veterinary and agricultural practices but they are hampered by the government's stringent price policy.
3. The colonists— who either immigrated to Paraguay since World War I, or moved out of the Central Zone. In general, they have larger farms than group (1) and at least the immigrants are better acquainted with modern methods. Moreover, they have more energy and initiative than the Paraguayans. As the colonies are often located in far away regions, transport is their main problem.

Large agricultural enterprises are rare in Paraguay. Even such products as cotton and sugar cane are grown mainly on small or medium sized farms. This indicates that there will be little need for full scale mechanization in this country; heavy machinery will be (at least for the time being) useful only for clearing new land. It would be best to operate them on a pool basis, with groups of farmers sharing the equipment. There is, however, a great need for good small tools and animal drawn implements, and also for initial quantities of fertilizers, insecticides and veterinary supplies.

The health of the rural population is rather poor. Their diet has a surplus of animal protein but a shortage of calcium. They eat too much meat and starches and not enough vegetables, fruit and milk. Many of the people in rural areas suffer from infectious diseases, goiter, and dental decay. Probably these diseases are partly responsible for the lack of energy which a large part of the population displays.

 Practically all of the people active in agriculture are poor or very poor. This applies to the long settled families as well as to most of the immigrants. Some of the causes of this situation are: the poor quality of most of the soils, obsolete equipment of the farms, lack of education and vocational training, lack of energy, insufficient transport and trading facilities and, last but not least, the wars and revolutions in which a great part of the farm animals and equipment have been repeatedly destroyed.

(f) Capital Goods

Cattle, the most important group of farm animals, have declined in numbers since 1942. At that time 4 million head of cattle were counted whereas the estimate for 1950 is only 3.4 million. This number includes the oxen widely used as draft animals for farm work and transportation. There are also 275,000 horses in Paraguay, practically all of very low quality, 200,000 sheep, 350,000 swine and a number of donkeys, mules and poultry.

The mechanical equipment of the majority of the farms is obsolete and inefficient. The hoe, machete and a simple wooden plow are the most common implements. For a number of years, however, government agencies have been active in the importation and distribution (on a credit basis) of good tools and implements among the farmers and the result of this work has been worthwhile if limited.
The farm buildings in general are extremely poor, with the exception of those belonging to the few farmers or colonists who have received help from the government's supervised credit program. The government has launched an important program for the building of grain silos for the storage of government purchased stocks.

(g) Government Policy

Although a government sponsored Agricultural Bank was established in 1887 and a college of agriculture in 1896, it is only in the last decade that the government has taken an active interest in the improvement of agriculture, the country's main industry. In 1941 a law on National Agricultural Orientation was passed which established an annual minimum production plan. It also made possible a system of fixed minimum prices, the granting of special credits, and the distribution of good seeds. In 1943 a Five-Year Plan was published, highlights of which were the redistribution of land, resettlement of farmers, improvement of education and veterinary service, promotion of immigration, utilization of forests, and better storage facilities. Mainly because of the assistance given by STICA, this Plan was actually set in motion and some promising things had been achieved before the Civil War of 1947 broke out. Since then there have been three years of decline but now there is a basis for further constructive work, mainly along the same lines as laid down in the above mentioned law and Five-Year Plan. An indication of the intentions of the Government may be found in the establishment in July 1950 of a separate Ministry of Agriculture and Cattle raising. An outline of what the government intends to do for agriculture was given in the Three-Year Plan which was submitted to the IBRD and which formed the basis for the recent discussions in Asuncion.

The objective of this Plan is to increase agricultural production mainly through the distribution of imported tools, implements, insecticides, fertilizers and veterinary products. These requisites will be sold to the farmers with the help of credits to be extended by the Credito Agricola de Habilitacion and the Agricultural Credit Division of the Bank of Paraguay. Other important items in the Plan are the establishment of machinery pools in some colonies; the building of a road in the southern part of the country, which will connect a colonization area with the port of Pilar, and the rehabilitation of the Agricultural College.

The Plan does not stipulate anything about the price policy of the Government, its import-export policy, or its attitude towards land reform, immigration, processing industries, etc. Moreover, the Plan includes no overall calculations as to the increase in expenses and income in the agrarian sector which may result from the execution of this Plan. Notwithstanding these deficiencies the execution of this Three Year Plan may be a good beginning for the reactivation of Paraguay's main industry.

The still valid law of 1941 gives the Government the right to stimulate production of certain desirable crops by setting attractive prices for
them but inflation makes the execution of such a policy very difficult as prices fixed at the beginning of the agricultural season are always too low and unattractive at the time of the harvest.
II. CURRENT SITUATION

(a) Crops

Of the 360,000 ha. under cultivation in 1950/51, more than two-thirds were given over to six main crops (corn, 103,000 ha.; mandioca or cassava, 61,000 ha.; cotton, 58,000 ha.; sugar cane, 17,000 ha.; peanuts, 13,500 ha.; and cowpeas, 20,500 ha.). Other important crops are rice, tobacco, sweet potatoes and fruit, especially oranges. The main cash crops are cotton, sugar cane, tobacco and fruit. Over the last 10 years there has been about a 14% increase in the acreage devoted to corn, mandioca, cotton and sugar cane, although the total area under crops increased from 334,000 ha. in 1942/43 to 360,000 ha. in 1950/51, or by only 8%. This was caused mainly by the decrease in other important crops.

The following table shows how the main products have varied in the past ten years.

<table>
<thead>
<tr>
<th>Production of Principal Crops</th>
<th>1942/43</th>
<th>1950/51</th>
<th>Increase in Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>105</td>
<td>108</td>
<td>3</td>
</tr>
<tr>
<td>Mandioca</td>
<td>825</td>
<td>870</td>
<td>5</td>
</tr>
<tr>
<td>Cotton (unginned)</td>
<td>32</td>
<td>44</td>
<td>38</td>
</tr>
<tr>
<td>Sugar Cane</td>
<td>307</td>
<td>510 1/</td>
<td>66</td>
</tr>
<tr>
<td>Rice</td>
<td>13</td>
<td>18</td>
<td>38</td>
</tr>
<tr>
<td>Tobacco</td>
<td>7.4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Peanuts</td>
<td>13</td>
<td>11</td>
<td>-14</td>
</tr>
<tr>
<td>Cowpeas</td>
<td>16</td>
<td>16</td>
<td>-</td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>69</td>
<td>74</td>
<td>7</td>
</tr>
</tbody>
</table>

1/ Exceptionally high.

The improvement in the production of cotton, sugar cane and rice is partly due to special attention paid to them by government agencies, particularly by STICA.

In general the yields per ha. are not high in Paraguay as may be seen from the following table.
Yields of Principal Crops
(kg. per ha.)

<table>
<thead>
<tr>
<th></th>
<th>1948/49</th>
<th>1950/51</th>
<th>Average for South America in 1948</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>1069</td>
<td>1049</td>
<td>1490</td>
</tr>
<tr>
<td>Mandioca</td>
<td>1441</td>
<td>1426</td>
<td>13700 (Brazil)</td>
</tr>
<tr>
<td>Cotton (unginned)</td>
<td>678</td>
<td>570</td>
<td>460 1/</td>
</tr>
<tr>
<td>Sugar cane</td>
<td>22386</td>
<td>30000</td>
<td>38000 (Brazil)</td>
</tr>
<tr>
<td>Rice</td>
<td>2154</td>
<td>2000</td>
<td>1600 (Chile &amp; Peru 3400)</td>
</tr>
<tr>
<td>Tobacco</td>
<td>1209</td>
<td>820</td>
<td>950</td>
</tr>
<tr>
<td>Peanuts</td>
<td>914</td>
<td>800</td>
<td>970</td>
</tr>
<tr>
<td>Cowpeas</td>
<td>790</td>
<td>838</td>
<td>880</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>9630</td>
<td>9500</td>
<td>8300 (1947)</td>
</tr>
</tbody>
</table>

1/ Peru, however, in 1948 produced 400 kg. ginned or 1100 kg. unnginned per ha.

Customarily the farmers sell practically all their cotton, sugar cane and rice crops, 80% of the tobacco they produce, a quarter of the corn crop, 7% of the manioc crop, 43% of the peanut crop, 23% of the cowpea crop and considerable quantities of small-sized coconuts, alfalfa, and such special products as tung beans, yerbamate leaves and castor beans.

Nearly all these products, including the two main cash crops (cotton and sugar), are grown by small or medium-sized farmers on rather small fields. Cultivation and harvesting are done by old fashioned, unmechanized methods. Weed and insect control and fertilizing are especially defective.

(b) Animals

The most important group of animals are the cows and oxen which are grown mainly to produce meat. Milk production is negligible and neglected. Due to a combination of many unfavorable factors the number of cattle have diminished in the last decade. One of the main factors is the too stringent price policy of the Government which keeps prices at a level considered unremunerative by the stockmen. Hence they are not interested in the introduction of better breeding cattle, better methods for the upkeep of their grazing grounds, the use of veterinary supplies, and of concentrated feeds to fatten their animals. This price policy is also the cause of widespread smuggling of cattle to Brazil. The idea behind the price fixing measure was to protect the consumers but because prices were originally determined at a level which was not remunerative for the cattlemen, and because the prices have not increased quickly enough to neutralize the effects of inflation on costs to the cattle growers, supply is now so short that the Government has had to order one meatless day every week and consumers sometimes have to buy on the black market. It is estimated that this price policy resulted in a decline in the number of cattle from 4 million in 1942 to 3.4 million in 1950.
(c) Meat Production

The total number of cattle slaughtered for domestic consumption went down from over 550,000 in 1941/42 to less than 500,000 in 1950. Even more serious is the fact that the cattle slaughtered for export declined from 100,000/150,000 in the early Forties to 26,000 in 1950. In order to keep operating, Paraguay's meat packing plants have had to import cattle from Argentina. Since that country has no more cattle available for export to Paraguay all three meat packing plants have closed down and it is uncertain whether they will be reopened in the near future.

(d) Export and Import

There is no mining in Paraguay and hardly any manufacturing industry. Practically all the export products are agricultural, and most of them, such as yerba mate, cotton fiber, quebracho extracts, tobacco, oils and meat products go through a simple stage of processing before they are exported. The internal economic activity of Paraguay and its balance of trade would undoubtedly be strengthened if the processing industries could be enlarged and modernized. The main exports are listed in the following table:

<table>
<thead>
<tr>
<th>Principal Exports</th>
<th>Volume (thous. m. tons)</th>
<th>Estimate</th>
<th>Value (million $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logs and lumber</td>
<td>59.0</td>
<td>241.0</td>
<td>250.0</td>
</tr>
<tr>
<td>Cotton</td>
<td>7.0</td>
<td>12.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Quebracho extracts</td>
<td>41.0</td>
<td>39.0</td>
<td>45.0</td>
</tr>
<tr>
<td>Meat products</td>
<td>17.0</td>
<td>12.0</td>
<td>14.0</td>
</tr>
<tr>
<td>Hides and skins</td>
<td>8.0</td>
<td>12.0</td>
<td>11.0</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>0.4</td>
<td>4.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Essential oil</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Tobacco</td>
<td>2.8</td>
<td>3.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Yerba Mate</td>
<td>7.3</td>
<td>1.3</td>
<td>4.0</td>
</tr>
<tr>
<td>Others</td>
<td>10.3</td>
<td>31.6</td>
<td>30.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>153.0</strong></td>
<td><strong>356.0</strong></td>
<td><strong>376.0</strong></td>
</tr>
</tbody>
</table>

The last column in this table is a preliminary estimate of exports for 1951. It is improbable that the estimated figure for meat exports will be realized.

The main imports in the agricultural sphere are live cattle (now difficult to obtain), wheat and salt.
Principal Imports of Food Products

<table>
<thead>
<tr>
<th></th>
<th>Volume 1948</th>
<th>Volume 1949</th>
<th>Value 1948 (million $)</th>
<th>Value 1949 (million $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live cattle (thous. head)</td>
<td>65</td>
<td>1.6</td>
<td>6.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Wheat (thous. tons)</td>
<td>23</td>
<td>32.0</td>
<td>7.1</td>
<td>9.0</td>
</tr>
<tr>
<td>Wheat flour (thous. tons)</td>
<td>8</td>
<td>6.0</td>
<td>2.2</td>
<td>1.9</td>
</tr>
<tr>
<td>Salt (thous. tons)</td>
<td>17</td>
<td>12.0</td>
<td>1.1</td>
<td>1.2</td>
</tr>
</tbody>
</table>

A coordinated and strong effort would make it possible to eliminate the import of cattle and at least to diminish considerably the import of wheat. Experiments to find suitable varieties of wheat have already been made.

Data on the import of farm requisites are inconsistent. The Boletin Estadistico del Banco del Paraguay states that imports in this category amounted to 1.5 million $ in 1947, 4.3 million $ in 1948, 5.7 million $ in 1949, and 5.6 million $ in 1950, whereas the Foreign Exchange Department of the Banco del Paraguay gave the following data: 1947, 858,000 U.S. dollars; 1948, 3.4 million U.S. dollars; 1949, 618,000 U.S. dollars and 1950, 586,000 U.S. dollars. Probably the latter data refer to the amounts of foreign exchange paid while the first series refers to the actual imports as they pass through the customs.

(e) Cost of Production

Few statistics are available on costs of production; the only real study in this field was made by STICA on rice output in 1948/49. This study disclosed that average costs per ha. were $ 699 with a spread from $ 498 to $ 1220 per ha. Average costs per ton of unhulled rice was $ 257. It is difficult to compare these data with those of other countries because of the great variation and rapid change in the rates of exchange which could be applied. It is, however, improbable that these costs will prove to be low and that Paraguay will be a potential exporter of rice in the future.

(f) Prices

The confused exchange rate situation also makes it difficult to compare minimum prices guaranteed by the Government to farmers with prices in other countries. A comparison of 1940 prices of individual products with those prevailing in 1950 discloses, however, that the latter are 5 to 7 times as high as the former prices.

The following table discloses some interesting details about the development of prices in Paraguay.
### Index Numbers of Wholesale Prices

<table>
<thead>
<tr>
<th></th>
<th>1938</th>
<th>1940</th>
<th>1947</th>
<th>December 1948</th>
<th>December 1949</th>
<th>December 1950</th>
</tr>
</thead>
<tbody>
<tr>
<td>General index</td>
<td>100</td>
<td>117</td>
<td>329</td>
<td>416</td>
<td>500</td>
<td>686</td>
</tr>
<tr>
<td>Agricultural products</td>
<td>100</td>
<td>100</td>
<td>345</td>
<td>451</td>
<td>535</td>
<td>760</td>
</tr>
<tr>
<td>Livestock products</td>
<td>100</td>
<td>101</td>
<td>298</td>
<td>338</td>
<td>473</td>
<td>735</td>
</tr>
<tr>
<td>Textiles</td>
<td>100</td>
<td>164</td>
<td>616</td>
<td>918</td>
<td>1075</td>
<td>1392</td>
</tr>
<tr>
<td>Costs of living in Asuncion</td>
<td>100</td>
<td>110</td>
<td>287</td>
<td>432</td>
<td>572</td>
<td>1026</td>
</tr>
<tr>
<td>Agricultural implements and machines</td>
<td>100</td>
<td>132</td>
<td>264</td>
<td>282</td>
<td>304</td>
<td>372</td>
</tr>
<tr>
<td>Steers for slaughter 1/</td>
<td>100</td>
<td>271</td>
<td>282</td>
<td>467</td>
<td>655</td>
<td></td>
</tr>
<tr>
<td>Cows for slaughter 1/</td>
<td>100</td>
<td>296</td>
<td>327</td>
<td>463</td>
<td>672</td>
<td></td>
</tr>
</tbody>
</table>

1/ Mid-year.

These data show that prices of livestock lagged seriously behind those of agricultural products in the years 1947 through 1949. Only recently have prices of cattle been brought closer to the general level.

On the other hand, the rise in prices of all farm products lagged seriously behind those of textiles (one of the main items on the farmers' budget), although by 1949 the prices of farm products paralleled the index of the cost of living in Asuncion. In 1950, however, the index of farm products was much lower than the cost of living index.

Prices of farm implements are kept low by the government which has of course, a favorable effect on farm costs.

### (g) Trade

There are no cooperatives in Paraguay. Trade in farm products is handled almost completely by private traders with the exception of the Bank of Paraguay which buys those farm products for which the Government guarantees minimum prices, if and when prices fall below those minima. On the other hand, the trade in farm implements and requisites is nearly monopolized by the Commercial Department of the Bank of Paraguay. This department has branch offices in the main rural centers and sells for cash or on credit at low prices.
III. ASPECTS OF AGRICULTURAL POLICY

(a) Central Zone

The first and main problem of Paraguayan agriculture is how to re­habilitate the Central Zone, extending to the North, east and south of Asuncion for some 100 km., and along the railroad from Asuncion to Encarn­acion. The soil of this area has been exploited for two or three centuries, practically without good cultivation and without manuring or fertilizing. There is hardly any virgin soil left in this region. Virtually all the original wood has been burned and only a shrub vegetation is left on those parts which are temporarily not under cultivation.

This region is considered overpopulated, which is true in so far as the soil in its present neglected state is not able to provide farmers with a reasonable income. But both soil and climate are basically suitable for agriculture and if cultivated properly, the soil should be able to produce enough crops for all the farmers who now live in the Central Zone.

The idea that this Zone is overpopulated has given rise to a policy of transferring farmers from this area to far away Departments where they can still find virgin soils.

Clarification of the confused land tenure situation in the Central Zone is promoted by the Government and the work which the Government Insti­tute of Agrarian Reform is performing in this respect deserves our close attention. As the farmers in this area are, in general, very poor, it is obvious that they need adequate help from the two Government credit agencies - the Agricultural Department of the Bank of Paraguay and the "Credito Agricola Habilitacion."

(b) Immigration

The natural resources of this country in the field of agriculture are too large to be exploited exclusively by the people who are now in Paraguay. Moreover, these people need to intermingle with new groups of energetic farmers who have knowledge of modern practices. For these reasons, it is worthwhile to promote immigration and colonization. The International Labor Organization is, at the request of the Government, studying the possibili­ties of large scale immigration and is cooperating with the Government to improve and modernize the immigration laws. Probably lack of capital to establish the necessary preliminary public works will be a major hindrance to quick and large scale import of farmers.

(c) Government Services

The future of Paraguayan agriculture depends very much on the quality and the strength of the services for vocational training, experimental and
extension work. At present there are virtually no extension services, no experiment stations, no agricultural press and no national organization of farmers. The educational system consists of a very poorly equipped national "college," five branch schools and one private agricultural school. This is completely insufficient both in quality and quantity. With assistance of Point IV experts and Point IV funds, a Coordinated Institute for Rural Education is now being organized which will train teachers and nurses for the rural districts, as well as extension officers and farmers. This Institute will open its doors in the spring of 1953. It will form a good basis for an extension service together with the National Institute for Agronomy (where very interesting experiments are made in soil conservation and in the propagation of seeds), and the experimental Dairy Farm of STICA, all located near Asuncion in the Central Zone.

(d) Processing Plants

Except for cotton, the processing facilities for agricultural products are insufficient. Most of the small coconuts grown in Paraguay are processed in small primitive presses which have a low yield of oil. Except for one plant, all of the sugar factories are small and old fashioned. Most of the hides are exported in the raw rather than in tanned form, although Paraguay is the leading world exporter of quebracho, an important tanning chemical. The extraction of tung oil nuts also can be improved very much and the same applies to the wood processing industry.

(e) Transport

The marketing of agricultural products in the Central Zone and the development of the colonization areas is hampered by the transport situation. Although a comprehensive study of this situation is in preparation by one of the Point IV experts, the following remarks may be made. The Central Zone is served by some fairly good roads and by the Central Railroad which connects Asuncion with Encarnacion. The trouble in this Zone originates mainly from (a) lack of spare parts and tires for the trucks, (b) the primitive ferries used to cross the rivers in the region, (c) the completely obsolete track of the Central Railroad, and (d) lack of feeder roads to the railway stations.

For the colonization areas the situation is more difficult. Because they are located mainly in remote districts where the Government is unable to build good roads quickly, the development of several otherwise promising colonies is seriously hampered by lack of transport. This applies to colonies along the Parana River, as well as to those more to the north in East Paraguay and to the Mennonite colonies in the Chaco. It is hoped that the small amount of road building equipment included in the loan now under consideration will expedite the building of the road from Encarnacion west and eastward.
(f) Forecast

Paraguayan authorities, in cooperation with STICA, have made an estimate of the increase in production which might result from the Three Year Plan, referred to in Chapter I. Though these estimates should be considered with great prudence, they give some idea of what might be possible if all the institutions and persons concerned cooperate to the best of their ability. A summary of these estimates is given in the table below.

**Forecast of Acreage in Production**
*(in thous. hectares)*

<table>
<thead>
<tr>
<th>Products</th>
<th>1942/43</th>
<th>1948/49</th>
<th>1950/51</th>
<th>1951/52</th>
<th>1952/53</th>
<th>1953/54</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2.2</td>
<td>2.4</td>
</tr>
<tr>
<td>Cotton</td>
<td>42</td>
<td>50</td>
<td>58</td>
<td>58</td>
<td>63</td>
<td>66</td>
</tr>
<tr>
<td>Rice</td>
<td>8</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Green Peas</td>
<td>2</td>
<td>0.5</td>
<td>1</td>
<td>1.2</td>
<td>1.3</td>
<td>1.4</td>
</tr>
<tr>
<td>Other Peas</td>
<td>20</td>
<td>22</td>
<td>20</td>
<td>20</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>7</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Sugar Cane</td>
<td>15</td>
<td>13</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>Corn</td>
<td>99</td>
<td>103</td>
<td>103</td>
<td>103</td>
<td>106</td>
<td>111</td>
</tr>
<tr>
<td>Manioc</td>
<td>57</td>
<td>60</td>
<td>61</td>
<td>61</td>
<td>66</td>
<td>71</td>
</tr>
<tr>
<td>Tobacco</td>
<td>6</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Peanuts</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>15</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>272</td>
<td>286</td>
<td>302</td>
<td>302</td>
<td>329</td>
<td>354</td>
</tr>
</tbody>
</table>

This estimate, which forecasts an overall 15% increase in cultivated area within three years time, seems rather optimistic. Nevertheless, it would be possible to reach this goal eventually, if all the people and services concerned could be united in one coordinated action. The estimate for rice, however, seems to be too high even under these circumstances.
The writer's suggestions as to some aspects of agricultural policy.

(a) Migration Policy

As stated on Page 11 the Government is stimulating the transfer of farmers out of the Central Zone to colonies in remote departments. This is, however, in my opinion no solution for the problems of the Central Zone. In the first place the Government is not able to move a sufficient number of farmers to new areas quickly enough to get substantial relief for the population pressure in the Central Zone. In the second place this migration policy does not improve the situation in the Central Zone, which is the natural supply area for the capital and the most suitable area for the production of export crops. Thirdly, a successful migration policy requires good road connections between the new areas and the markets, and since these are lacking in Paraguay a serious transport problem results. The Central Zone on the other hand, has an operating though obsolete railroad and a fairly good network of roads. Therefore it might be better to shift the emphasis away from moving farmers out of the Central Zone to a strenuous effort to improve agriculture in this Zone. This can be done by education of the young farmers, by extension work, import of good tools and implements, use of manure, fertilizers and insecticides, distribution of better seeds, etc.

(b) Cattle Industry

On Page 8 attention is paid to the rather alarming situation of the cattle industry. The number of cattle is declining; meat consumption has to be restricted, and the meat packing plants are closed as a result of the declining internal supply and the interruption of imports from Argentina. It is improbable that Argentina will again be able, or willing, to export cattle to Paraguay so that the three meat packing plants in that country will be dependent on internal production of cattle. This country has very extensive grazing grounds and it is technically possible to raise enough cattle both for internal consumption and for export of meat and hides (or leather). If the price policy of the Government could be flexible enough to make prices in Guaranies attractive to the ranchers; 1/ if in addition smuggling of cattle to Brazil could be stopped; the number of veterinarians increased and an ample supply of medicines and barbed wire could be made available; this goal could be reached in a limited number of years.

1/ In August, 1951, prices of cattle were increased considerably but with inflation going on this will not have a long lasting influence.
(c) **Transport of Agricultural Products**

On Page 12 a short description is given of the transport situation. Though definite and far-reaching proposals can only be made after the completion of the overall report on the transport situation, which is now in preparation by one of the Point IV experts, the following remarks seem to be valid to the present writer.

There are at least three distinct problems:-

1. **That of the Central Zone** -
   Import of spare parts and tires for trucks, construction of some bridges or good ferry boats, and the building of simple feeder roads to the railroad may improve the situation quickly. The reconstruction of the Central Railroad will however be an expensive and time-consuming affair.

2. **That of the areas of colonization** -
   This colonization (and consequently also the immigration from abroad) can only be extended on a large scale when a network of all-weather roads is built. The building of this network is beyond the capacity of both the funds and the organization of the Paraguayan Ministry of Public Works. For this reason it might be desirable for the Government to apply for technical assistance in designing the roads and in supervising the construction, and for financial assistance for the import of equipment.

3. **That of the connection with ocean ports** -
   This problem will be dealt with in the report of the above-mentioned expert.
LITERATURE USED IN THE PREPARATION OF THIS REPORT

15. Economic Development in Latin America, S.G. Hanson, Inter American Affairs Press, 1951.
MAP NO. I

PARAGUAY

POPULATION DENSITY

PERSONS PER SQ. MILE

- Less than 1
- 1 to 25
- 25 to 75
- 75 to 200
- over 200

ARGENTINA